SANAV™

GSM/GPS Micro Tracker

Model G-19B

User's Manual

CE No: EM/2004/80113C
FCC ID: RUU-G19041000

Version: 2.6-RO

Published: December 2004

PREFACE

Thank you for purchasing the SAN JOSE NAVIGATION G-19B GSM/GPS Micro Tracker. This deliberately edited manual is to introduce the users, to provide the complete technical data that is needed, and so as to operate G-19B smoothly and correctly as soon as possible. Make sure to read this manual carefully before using this product. Most problems will be solved through the explanations and the troubleshooting tips. Once you finish reading it, keep it handy for necessary reference.
Please note that specification and information are subject to change without prior notice in this manual. Any change consequently will be integrated into future editions. The manufacturer assumes no responsibility for any errors or omissions in this document.

This manual is divided into the following chapters:

Chapter	Content	Information
1	Hardware Description	Brief Introduction of Hardware Parts and Status
2	Getting Started	General Installation & Operation Guide
3	General Functions	Complete Functions Description
4	Setup SMS Messages	Detail Setup SMS Messages Information
5	Respond SMS Messages	Detail Respond SMS Messages Explanation
6	NMEA-0183 $GPRMC Description	NMEA-0183 $GPRMC GPS Coordinate Data Description
7	General Specifications	Specifications of modules used in G-19B
8	Warranty	After Sales Services & Limited Warranty for this Product
9	FAQ	Trouble Shooting

SANAV™

Table of Contents

1 **Hardware Description**.....5

2 **Getting Started**.....10

3 **General Functions**.....11

4 **Setup SMS Messages**.....13

4.1 Change ID. 14
4.2 Built-in Cellular Phone Setup.....15
4.3 Report Interval Setup.....16
4.4 Remote Parking Start Setup.....17
4.5 Reset to Factory Default.....18
4.6 Change Password.....19
4.7 SMS Polling Command.....20

5 **Respond SMS Messages**.....21

5.1 Polling/Auto Report.....22
5.2 Parking.....23
5.3 Emergency.....25
5.4 Power Low Alert.....27

6 **NMEA GPRMC Description**.....28

7 **General Specifications**.....29

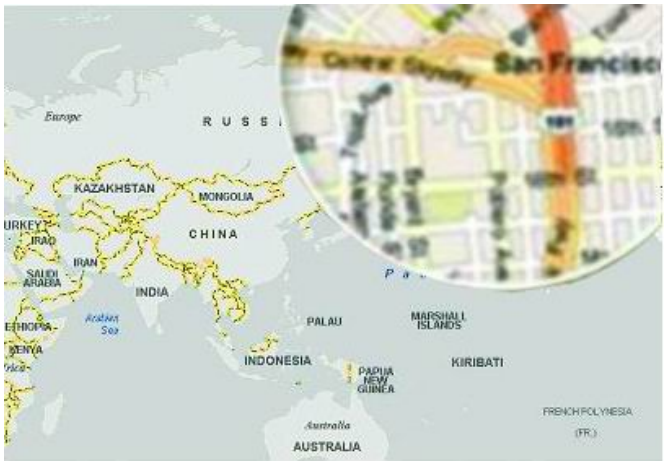
8 **Warranty**.....30

9. **FAQ**.....31

Chapter 1 Hardware Description

Main Unit

Package Contents	
Battery x2	Wall Charger (100 ~ 240V AC) x1
CD x1 (User manual & MapTracking software)	Cigar Charger (8 ~ 38V DC) x1

Optional Accessories For MapTracking	
Personal Computer	Cellular Phone (Sagem X2, Siemens C62)
	
Modem (Siemens TC35, MC35)	Vector Map (Refer to the list for available maps)

Note1: The compatible maps are "Microsoft Street & Trip 2004"," Microsoft Europe MapPoint 2004", "GPSS", "Fugawi", "Taiwan PaPaGo", "Hon Kong MapKing", and other vector maps accept GPRMC sentences.

ON/OFF Switch	
	Turn On/Off G-19B by this switch While initializing G-19B by switching it on, G-19B's Link, Fix and Park LEDs will light for 3 seconds, and become off. G-19B will then start searching the GSM station and getting the GPS fix.

Eject Button	
	Use a sharp tool to eject the SIM card slot. Please read the SIM Card Slot for more information about how to insert a SIM card in it.

GSM Indicator (Red LED)	
	Blinking when G-19B is searching GSM network service Light still and have a short blinking every 4 seconds when GSM service is available Off when no power

GPS Indicator (Blue LED)	
	Off when GPS is not available On when G-19B fixes the current GPS position

Mini-USB Connector	
	This Reserved Com Port is for engineering purpose. Please do not try to utilize it before having proper instruction.
External DC Power Connector	
	G-19B power source that adapts 6V DC

Wall Charger	
 	The picture shows the European standard (100V~250V) wall charger. It takes about 3 hours to fully charge the battery.

Cigar Charger

The picture shows the cigar charger, which you can charge the G-19B in the car. It takes about 3 hours to fully charge the battery.

SIM Card Slot

1. Use a sharp tool to eject the SIM card slot.

2. Pull the slot out and put a valid SIM card in it by following the correct orientation. Before that, you have to deactivate the PIN code if there is any.

3. Push the slot back into the G-19B. Don’t push too hard if you find it difficult to insert the slot. Try to pull it out and push it back gently.

Park	
	1. Press when you park your car. 2. When Park function is activated, the green LED will be lighted on. The LED is embedded at the place where the red arrow points in the picture. 3. Towed SMS will be sent when your car is moved over 100m or the speed is over 3km/hr.

Emergency Panic Button	
	Press when an emergency situation occurs. Built-in buzzer will start buzzing for alert. Emergency SMS messages will also be sent to the built-in cellular phone number(s)

Battery	
	1. If you would like to change the battery, you may open the battery case by sliding the plastic cover. 2. After removing the cover, unplug the connector. See the picture placed in the middle. 3. Pull out the battery and install the spared one provided. 4. Gently put back the plastic cover by following the track.

Chapter 2 Getting Started

1. Charge the battery for 3 hours by using the **wall charger** **(*page7*)** or **cigar charger** **(*page7*)** provided if you would like to run the G-19B by battery embedded.

2. Please prepare a valid GSM SIM Card.

3. Insert the SIM card by following the procedure shown in **SIM Card Slot** **(*page8*)**.

4. Place the G-19B upward and let it has a clear sky vision. **Switch** the power on.

5. You also can run or evaluate the G-19B while it is charging.

6. The **Red LED** will be blinking while G-19B is searching the GSM network.

7. After 10 ~ 20 flashes, the red LED should stay still. GSM network connection is successful. If you have any difficulties, please refer to the FAQ in the last *page*.

8. For the first-time operation of G-19B, the **Blue LED** will light on and keep still within 90 seconds. That means the G-19B gets the GPS fixed. If you have any difficulties, please refer to the FAQ the last *page*

9. You may start tracking!

Chapter 3 General Functions

After completing the procedures in **Chapter 2** (*page10*) and both red and blue LED keep the lights still, you may try the following functions of G-19B.

The General Functions are described as following.

Polling (Requesting immediate response from G-19B)

There are 2 methods to obtain the immediate response from G-19B.

Method 1:

Dial the phone number of G-19B through your mobile phone, and then you will receive a respond message within 20 seconds, depending on how busy the GSM network is.

Method 2:

When you are in overseas, you can send a command via SMS to the G-19B (see Chapter 4.7, *page22*). And then you will receive a respond message.

Note1: *G-19B can accept any cellular phone call and reply SMS message to the one that is calling.*
Note2: *Once the "Own Number Sending" function is deactivated in your cellular phone, G-19B will not recognize the calling number so as to lose polling function.*

Change User ID and Password

The default user ID and password of G-19B is "Username" and "0000" respectively. You can change them according to your preference. Please refer to Chapter 4.1 (*page 14*) and Chapter 4.6 (*page21*) for more information about how to change User ID and Password.

Predefine Cellular Number(s)

Before using the functions of **Auto Report**, **Emergency Alert** and **Park**, you need to predefine at least one and maximum of 5 cellular numbers. Please refer to Chapter 4.2 (*page15*) for more information of this setup.

Auto Report

G-19B can report SMS message only to the designate cellular phone. It is the first cellular number predefined in G-19B. However, the default Auto Report function is off. To turn on Auto Report function, send the setup SMS message to launch. See chapter 4.3 for further information.

Emergency Alert

When in emergency circumstance, you can press-and-release the on board "Panic Button" and G-19B will send SMS message(s) to ***ALL*** the predefined cellular number(s). If you would like the draw attentions from people, you can press and hold on the button for more than 2 seconds. The built-in buzzer will alarm for 20 seconds and send emergency SMS message(s) at the same time.

Note1: *When the time you activate the buzzer by press-and-hold the Panic button for 2 seconds, the buzzer will be always alarmed in the future once you press the Panic button, even you just press-and-release.*

Note2: *If you would not like the buzzer to be always alarmed, you can switch G-19B off for 30 seconds and then on.*

Parking

While you park or leave your vehicle or valuable asset for some personal purposes, you can press "Park" button to guard it. Once the Park function is launched and the carrier is 1) moved without permission for over 100m from the original position *or* 2) the moving speed is over 1 kn/hr (1.83 km/hr), G-19B will report "towed" messages to user for burglarproof purpose. The Parking SMS will only be sent to the 1st cellular phone number "PH-01" predefined in G-19B. The SMS contains the GPRMC's UTC time, latitude and longitude information for you to track the carrier.

Note1: *Park function will not be activated when GPS is down (blue LED is gone).*

Note2: *Besides pressing the Park button activate Park function; you also activate it from distance by sending the G-19B an SMS. Please see chapter 4.4 (page 19) for more information.*

Note3: *Each of the "Auto Report", "Emergency Alert", and "Parking" function needs to predefine the cellular phone number(s) for SMS sending.*

Low Power Alert

When G-19B is in the condition of low power, it will automatically send you a SMS to inform you. In the SMS, it contains the GPRMC's UTC time, latitude and longitude information for you to track the carrier. The description is seen in Chapter 5.4, page??.

Chapter 4 Setup SMS Messages

G-19B currently provides 7 commands to setup its functions. You can setup the G-19B by following the instructions shown in this chapter via SMS through your cellular phone. Key the specific SMS message in your cellular as the instruction, sending it to the phone number of G-19B. The setup messages are seen in the following sections.

Note1: *Before doing any setup, please ensure G-19B is connected with the GSM network. The red LED must be lighted on and keep still.*

Note2: *While you are keying in any setup message, note that NO space is allowed in between the characters. Characters can be letters, commas or any signs.*

Note3: *Any setup message must be started with a "#" sign and ended up with a "*" sign.*

Note4: *Only when the password and setup message are correct, the G-19B will update information itself according to user's definition.*

Note5: *Be sure to add the "Country Code" when you setup G-19B's phone numbers; G-19B can accept the "+" sign (e.g. +49xxxxxxxxx for German).*

4.1 Changing ID

You can change the ID of G-19B by following the format below. No space is allowed in between the characters. For example, if you send the SMS message shown in *E.g.1* to the G-19B, you will change the ID from “Username” to “GPS00001”.

E.g.1

#Username,0000,1,GPS00001,GPS00001*

The table 4.1.1 is describing the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
Username	Default ID of G-19B.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
1	Mode 1 is representing the ID setup
GPS00001	✧ New ID defined by the owner. ✧ *At the maximum of 8 characters.*
GPS00001	Confirm the new ID by keying it again. It must be exactly the same as the new ID keyed previously.
*	End sign.

Table 4.1.1

The table 4.1.2 is showing each confirm message reply after setup.

Situation	Message Reply
Setup Succeeds	GPS00001 setup OK. G-19B ID updated.
Setup Fail	Username setup fail.
G-19B is in Emergency Mode	Username in emergency, ID setup not allowed.

Table 4.1.2

4.2 Predefine Cellular Number(s)

Use this SMS message to predefine the cellular number(s) of your G-19B for **Auto Report, Emergency** and **Park** functions. By following the format of message, *E.g.2* below, you will predefine 5 sets of cellular numbers in G-19B.

E.g.2

#Username,0000,2,+886123456789,+492234567890,+866323456789,
+886423456789,+886523456789*

The table 4.2.1 is describing the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
Username	Default ID of G-19B.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
2	Mode 2 is representing the ID setup
+886123456789, +492234567890	1st set of cellular numbers, **PH-01**, 2nd set of cellular numbers, **PH-02**
+866323456789, +886423456789	3rd set of cellular numbers, **PH-03**, 4th set of cellular numbers, **PH-04**
+886523456789	5th set of cellular numbers, **PH0-5**
*	End sign.

Table 4.2.1

The table 4.2.2 is showing each confirm message reply after setup.

Situation	Message Reply
Setup Succeeds	**Username setup OK. G-19B phone updated.**
Setup Fail	**Username setup fail.**
G-19B is in Emergency Mode	**Username in emergency, phone setup not allowed.**

Table 4.2.2

Note1: *In order to be compatible with GSM Network Service in different countries, it is suggested to add the country code before the predefined cellular number(s) in G-19B. Please do not forget to add a "+" sign before the country code.*

Example: +491783496936 (German)

Note2: *If you want to setup only 1 set of phone number for G-19B to report, you need to add 4 commas "," straight after the phone number. G-19B needs to recognize and separate different built-in numbers.*

*Example: #Username,0000,2, +886123456789,,,,**

4.3 Auto Report Interval Setup

Use this SMS message to set up the frequency for **Auto Report** function after predefining the cellular number(s). If you send the SMS according to *E.g.3* seen below, you will have an Auto Report Message every 2 minutes. After 12 Auto Report messages are sent, G-19B will stop sending.

E.g.3

#Username,0000,3,002,12*

The table 4.3.1 is describing the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
Username	Default ID of G-19B.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
3	Mode 3 is representing report interval setup.
002	✧ Auto Report interval in minutes. ✧ **This parameter must be 3 digits.** The minimum unit is 002 and maximum is 120 minutes. ✧ For example, 002 means that an Auto Report message will be sent every 2 minutes. ✧ **To cancel Auto Report function, set the interval as "000**". The default setting of auto report is also off.
12	✧ Total number of SMS will be sent. ✧ **This parameter must be 2 digits.** ✧ For example, 12 means that only 12 Auto Report messages will be sent in total. After that, G-19B will stop sending. ✧ If you set up this value being **"00"**, the G-19B will stop Auto Report.
*	End sign.

Table 4.3.1

The table 4.3.2 is showing each confirm message reply after setup.

Situation	Message Reply
Setup Succeeds	**Username setup OK. G-19B auto-report.**
Setup Fail	**Username setup fail.**
G-19B is in Emergency Mode	**Username in emergency, auto-report not allowed.**

Table 4.3.2

4.4 Activate Parking Function From Distance

Use this SMS message to remotely activate the **Park** function after predefining the cellular number(s). You can just send the SMS according to *E.g.4* seen below to G-19B to activate the Park function. If you have changed the default ID, please use the updated one instead of "Username".

E.g.4

#Username,0000,4*

The table 4.4.1 is describing the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
Username	Default ID of G-19B.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
4	Mode 4 is representing the Activation Of Parking Function From Distance.
*	End sign.

Table 4.4.1

The table 4.4.2 is showing each confirm message reply after setup.

Situation	Message Reply
Setup Succeeds	**Username setup OK. G-19B parking.**
Setup Fail	**Username setup fail.**
G-19B is currently not GPS fixed	**Username GPS Time To First Fix, parking not allowed.**
G-19B is in Emergency Mode	**Username in emergency, parking not allowed.**

Table 4.4.2

Note1: You can also launch the parking function by pressing the "Park" button on G-19B.

4.5 Reset to Factory Default

Use this SMS message to reset G-19B to factory default. You can just send the SMS according to *E.g.5* seen below to G-19B to do resetting. If you have changed the default ID, please use the updated one instead of "Username".

E.g.5

#Username,0000,5*

The table 4.5.1 is describing the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
Username	Default ID of G-19B.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
5	Mode 5 is representing the Reset.
*	End sign.

Table 4.5.1

The table 4.5.2 is showing each confirm message reply after setup.

Situation	Message Reply
Setup Succeeds	**Username setup OK. G-19B reset to default.**
Setup Fail	**Username setup fail.**
G-19B is in Emergency Mode	**Username in emergency, reset not allowed.**

Table 4.5.2

When the reset setup is successful, all the user setting data in G-19B will be erased and reset to default. Default settings are seen below.

Setting	Default Value
ID	Username
Password	0000
Time Interval (in minutes)	000
Total Number of Report	12
Predefined Cellular Number	Non
Parking	Disable

4.6 Changing Password

Use this SMS message *E.g.6* seen below to change the password of G-19B

E.g.6

#Username,0000,6,5725,5725*

The table 4.6.1 is describing the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
Username	Default ID of G-19B.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
6	Mode 6 is representing the Changing Password.
5725	New password. It has to be **4 digits.**
5725	Confirm the new password by repeating it.
*	End sign.

Table 4.6.1

The table 4.6.2 is showing each confirm message reply after setup.

Situation	Message Reply
Setup Succeeds	**Username password setup OK**
Setup Fail	**Username setup fail.**
G-19B is in Emergency Mode	**Username in emergency, password not allowed.**

Table 4.6.2

4.7 SMS Polling

Besides dialing the number of G-19B to obtain immediate response, you also can use SMS to do the same job. This is extremely useful when you are abroad. You can just send the SMS according to *E.g.7* seen below to G-19B to obtain immediate response. If you have changed the default ID, please use the updated one instead of "Username".

E.g.7

#Username,0000,7*

The table 4.7.1 is describing the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
Username	Default ID of G-19B.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
7	Mode 7 is representing the SMS Polling.
*	End sign.

Table 4.7.1

Situation	Message Reply
G-19B is in Emergency Mode	**Username in emergency, SMS report not allowed.**

Once this SMS is sent successfully, you will receive a reply SMS from G-19B within 30 seconds, depending on how busy the GSM network is.

Note1: *You will read the same reply message as you dial the G-19B.*

Note2: *The description of each reply message will be seen in the coming chapter.*

Chapter 5 Respond SMS Messages

This chapter shows you how to read and understand the data/SMS sent from G-19B. According to different situations, the G-19B will send the SMS in different formats for you to distinguish them. Basically, there are 3 formats and they listed as below.

5.1 Via Dialing/ Poll Via SMS/ Auto Report……22
5.2 Park……..23
5.3 Emergency……25

5.1 Poll Via Dialing / Poll Via SMS /Auto Report

Message Example

$Username,GSM:46697,BTS:2906F250,Respond,Now(Previously 17:26),At position of
$GPRMC,092621,A,2458.4607,N,12126.1723,E,000.0,039.1,090204,003.5,W,A*0A

The table 5.1.1 is describing the meaning of each segment in the message above.

Text Shown In SMS	Description
$	Start sign.
Username	Default ID of G-19B.
GSM:46697	✧ The GSM Provider ID. ✧ In this case, 46697 is the GSM provider ID. This ID should be changed automatically once you change the GSM service provider.
BTS:2906F250	✧ The GSM Station ID ✧ It indicates the BTS code of current GSM station used for transmission. In this case, 2906F250 is the Station ID.
Respond	Indicates this SMS is sent from G-19B for respond purpose. It will be shown only when Polling and Auto Report.
Now(Previously 17:26)	✧ This segment indicates GPS data validity of G-19B. ✧ If this segment is “Now”, it indicates GPS fix is in real time. ✧ If this segment is in 24 hour time format such as “Previously 17:26”, it indicates G-19B currently cannot receive enough GPS signal to fix position so as to send the last GPRMC data at that time (it will be transformed to local time directly).
$GPRMC	GPS NMEA information from GPS receiver, including UTC time, latitude, longitude, speed, true course, etc. See Chapter 6 for detail.
*	End sign.

Table 5.1.1

Note1:*If you are not sure about how to get the SMS via dialing, SMS or Auto Report, please refer to the page ? for more information.*

5.2 Parking

Message Example

$Username,GSM:46697,BTS:2906F250,Towed (Still),Move 450m NE,Now(Previously 17:26), At position of $GPRMC,092621,A,2458.4607,N,12126.1723,E,000.0,039.1,090204,003.5,W,A*0A *

The table 5.2.1 is describing the meaning of each segment in the message above.

Text Shown In SMS	Description
$	Start sign.
Username	Default ID of G-19B.
GSM:46697	✧ The GSM Provider ID. ✧ In this case, 46697 is the GSM provider ID. This ID should be changed automatically once you change the GSM service provider.
BTS:2906F250	✧ The GSM Station ID ✧ It indicates the BTS code of current GSM station used for transmission. In this case, 2906F250 is the Station ID.
Towed (Still)	After you press the “Park” key, while the carrier’s position is away from its parking space over 100m, G-19B will auto report “towed” message to the first predefined phone number, PH-01; otherwise it will report “still”.
Move 450m NE	✧ This segment indicates the movement of G-19B. ✧ G-19B will calculate the distance between the original position of your car and current position to show the moved distance and on-going direction.
Now(Previously 17:26)	✧ This segment indicates GPS data validity of G-19B. ✧ If this segment is “Now”, it indicates GPS fix is in real time. ✧ If this segment is in 24 hour time format such as “Previously 17:26”, it indicates G-19B currently cannot receive enough GPS signal to fix position so as to send the last GPRMC data at that time (it will be transformed to local time directly).
$GPRMC	GPS NMEA information from GPS receiver, including UTC time, latitude, longitude, speed, true course, etc. See Chapter 6 for detail.
*	End sign.

Table 5.2.1

Interval of Parking SMS Message

After G-19B detect your car is towed, G-19B will send SMS messages **EVERY 30 MINUTES FOR 12 TIMES (See Diagram 5.2 below)** *only* to the first predefined phone number, PH-01 so as to remind the user that the carrier may be stolen or towed by someone. Check 4.2 for more PH-01 setup detail.

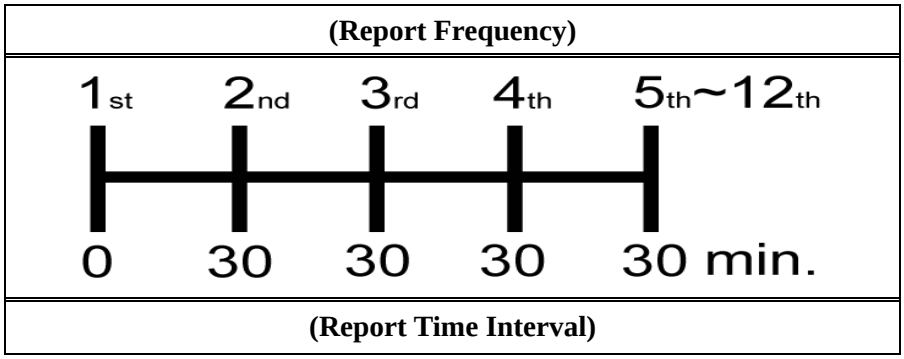


Diagram 5.2

Parking Report Frequency: Total 12 Times

Parking Report Time: Every 30 Minutes, Total 6 Hours

5.3 Emergency

Message Example

$Username,GSM:46697,BTS:2906F250,Emergency,Now(Previously 17:26),At position of $GPRMC,092621,A,2458.4607,N,12126.1723,E,000.0,039.1,090204,003.5,W,A*0A

The table 5.3.1 is describing the meaning of each segment in the message above.

Text Shown In SMS	Description
$	Start sign.
Username	Default ID of G-19B.
GSM:46697	✧ The GSM Provider ID. ✧ In this case, 46697 is the GSM provider ID. This ID should be changed automatically once you change the GSM service provider.
BTS:2906F250	✧ The GSM Station ID ✧ It indicates the BTS code of current GSM station used for transmission. In this case, 2906F250 is the Station ID.
Emergency	✧ Indicating G-19B is in Emergency status. ✧ Sent only when **Panic Button** is pressed. Please note that when the button is pushed no longer than 1 second, the buzzer will not alarm. Only when the button is pressed and held for more than 2 seconds should the buzzer activate. (But the SMS will always be sent to ALL the predefined phone numbers disregarding the buzzer)
Now(Previously 17:26)	✧ This segment indicates GPS data validity of G-19B. ✧ If this segment is “Now”, it indicates GPS fix is in real time. ✧ If this segment is in 24-hour time format such as “Previously 17:26”, it indicates G-19B currently cannot receive enough GPS signal to fix position so as to send the last GPRMC data at that time (it will be transformed to local time directly).
$GPRMC	GPS NMEA information from GPS receiver, including UTC time, latitude, longitude, speed, true course, etc. See Chapter 6 for detail.
*	End sign.

Table 5.3.1

Note1: *All the setting functions will be invalid once the Emergency is launched.Only when the power of G-19B is turned off should the Emergency status be cancelled.*

Interval of Emergency SMS Message

After the emergency button is pressed, G-19B will send SMS messages to all the predefined cellular numbers (5 sets at most) to call for help. Its transmitting time interval is illustrated in *diagram 5.3* as following:

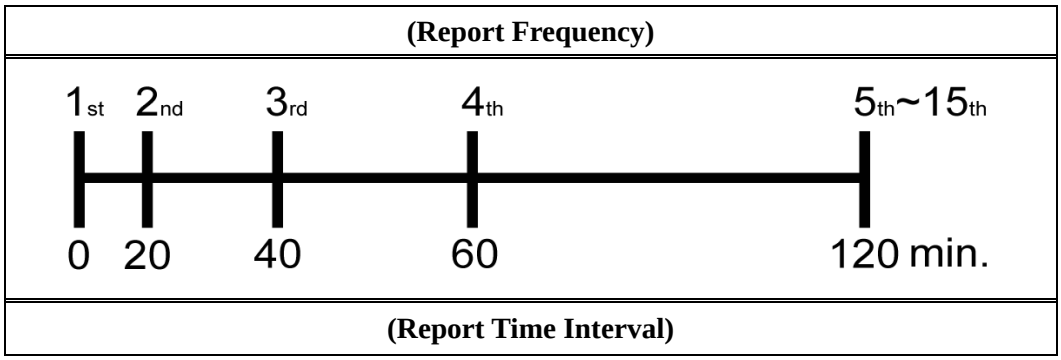


Diagram 5.3

Emergency Report Frequency: Total **15** Times

Emergency Report Time: Total **24** Hours.

5.4 Low Power Alert

Message Example

$Username,Power low,Check/recharge,Last trace-
$GPRMC,092621,A,2458.4607,N,12126.1723,E,000.0,039.1,090204,003.5,W,A*0A

The table 5.4.1 is describing the meaning of each segment in the message above.

Text Shown In SMS	Description
$	Start sign.
Username	Default ID of G-19B.
Power low	Indicates the power of the battery embedded is low.
Last trace	Before the power is exhausted, G-19B will send a SMS containing information about the last position.
$GPRMC	GPS NMEA information from GPS receiver, including UTC time, latitude, longitude, speed, true course, etc. See Chapter 6 for detail.
*	End sign.

Table 5.3.1

Chapter 6 NMEA-0183 $GPRMC Description

$GPRMC(out)

UTC, position, course, speed, etc.

Example

$GPRMC	,123456	,A	,3444.0000,N	,13521.0000,E		
Field# 1	2	3	4	5	6	
,005.6	,123.5	,020102	,001.0,W	,A		
7	8	9	10	11	12	
*08	CR LF					
13						

#.	Description	Range	[Bytes]
1.	UTC: Time		
	"12": hh	00-23	[2]
	"34": mm	00-59	[2]
	"56": ss	00-59	[2]
	Until the positioning is completed, a null field is output. If interrupted after positioning is done, the receiver continuously outputs the time when the last positioning is done.		
2.	Status	A or V	[1]
		"A": Data valid (Stand-alone or DGPS)	
		"V": Navigation receiver warning	
3-4.	Latitude		
	"34":degree	00-90	[2]
	"44": minute (integer)	00-59	[2]
	"0000": minute (fraction)	0000-9999	[4]
	"N": North/South	N or S	[1]
5-6.	Longitude		
	"135": degree	000-180	[3]
	"21": Minute (integer)	00-59	[2]
	"0000": Minute (fraction)	0000-9999	[4]
	"E": East/West	E or W	[1]
7.	Speed (kts)		
	"005.6"	000.0-999.9	[5]
	Note: A null field is output unless speed information is available.		
8.	True Course (degree)		
	"123.5"	000.0-359.9	[5]
	Note: A null field is output unless true course information is available.		
9.	UTC: Date		
	"02": DD	01-31	[2]
	"01": MM	01-12	[2]
	"02": YY	02-79	[2]
	Until the positioning is completed, a null field is output. If interrupted after positioning is done, the receiver continuously outputs the time when the last positioning is done.		
10-11.	Magnetic Deviation (degree)		
	"001.0"	000.0-180.0	[5]
	"W"	W or E	[1]
		"W": West (MAG=TRUE-DEV)	
		"E": East (MAG=TRUE+DEV)	
12.	Positioning System Mode Indication	A: Autonomous mode	[1]
		D: Differential mode	
		N: Data not valid	
13.	Checksum		[2]
	8 bits data between "$" and "*"(excluding "$" and "*") are XORed, and the result is converted to 2 bytes of hexadecimal letters. Only RMC sentences are transmitted with checksum. All other output sentences do not include checksum fields.		

Interpreting Example

UTC Time 12:34:56
Positioning
34 deg. 44.0000 min. N
135 deg. 21.0000 min. E
Speed: 5.6 kts
True Course: 123.5 degrees
UTC Date Jan 2, 2002
Magnetic Deviation: 1.0 degree, West

Chapter 7 General Specifications

GPS Micro Tracker Model G-19B

Dual Band GSM Module (EGSM 900/1800 MHz), Tri-band 1900 MHz Optional

Compliant with ETSI GSM Phase 2+ standard Class 4 (2W @ 900 MHz)

Class 1 (1W @ 1800/1900 MHz)

Equipped with 16 parallel channels GPS receiver in 0.35u CMOS technology

Emergency "panic" button

Acquisition Time

Reacquisition	<2 sec
Cold	<60sec TTFF (Time to First Fix)
Warm	<35 sec TTFF
Hot	<10 sec TTFF

Accuracy

Position Accuracy	15 meters RMS without SA
Velocity Accuracy	0.1 m/s without SA
Speed Accuracy	0.1 km/h without SA

Antenna Type

Internal GSM antenna / Internal GPS patch antenna

Power Supply

12V DC Cigarette Lighter/3.6V DC Li-Ion Battery (Option)

Operation Time

20hr minimum after full charged, in continuous mode.

Device Size and Weight

45 (W) x 66 (L) x 25 (H) mm, 87g

Environmental

Operating Temperature: -30°C to + 70°C

Storage Temperature: -40°C to + 85°C

Relative Humidity: 5% to 95%, non-condensing

Obtain CE and FCC approval with **CE** No: EM/2004/80113C and **FCC** ID: RUU-G19041000

Specifications subject to change without notice

Chapter 8 Warranty

Warranty Time Period and Repair Coverage

SAN JOSE NAVIGATION, INC. warrants G-19B to be free from all defects and malfunctions in materials and workmanship for a period of 12 months from the original purchase date from San Jose Navigation or authorized dealers. If the equipment functions improperly during the warranty period, San Jose Navigation will either repair or replace the unit without charge. Such repair service will include necessary adjustment, remanufacture, and replacement. The product should be returned freight-prepaid by the purchaser within valid warranty period. **Notice that you must contact San Jose Navigation for a RMA (Return Material Authorization) number before returning the goods for repair**.

Telephone assistance will also be provided during the warranty period.

Limitations

This warranty is limited only to the repair or replacement of defective parts confirmed by San Jose Navigation to be a result of faulty materials or workmanship. Instruments mechanically or physically damaged due to the following conditions are beyond our warranty:

1. **Neglect, misuse or abuse, such as incorrect testing, installation, or operation.**
2. **Place subject in extreme environments beyond the limits of the specifications.**
3. **Subjected to disassembling, soldering, alteration, unauthorized repair, and electrical shock by nature.**
4. **Any incidental or consequential losses or damages result from the purchase.**
5. **Disaster, accident, cost or loss of any substitutive equipment.**

For damages caused under the above conditions, we'll contact you to discuss replacement options.

SANJOSE NAVIGATION, INC.
9F NO. 105 SHI-CHENG ROAD, PAN-CHIAO CITY
TAIPEI HSIEN, TAIWAN, R.O.C.
TEL: 886-2-26879500
FAX: 886-2-26878893
WWW.SANAV.COM

TÜV 122070
Deutscher Akkreditierungs Rat DAR TGA-ZM-07-92
ISO 9001:2000
12 100 18526 TMS

FAQ

Q:
GSM indicator (Red LED) kept blinking and never being still.
A:
You may eject the **SIM Card Slot** (page8) and reinstall it. Then examine the GSM network availability by a working mobile phone. Please use the same GSM service provider as what G-19B has. Also check the PIN code of the SIM card in G-19B is deactivated.

Q:
When polling, GSM indicator (Red LED) is fixed, but no reply message after G-19B hang up the call.
A:
Please check 2 things.
1. If you are using the pre-paid SIM card, please check there is enough credit in it.
2. Check if you activate “Own Number Sending” on your mobile phone.

Q:
After switching on, the GSM indicator (Red LED) will flash or be still for a period of time and then drop off (Red LED is gone).

A:
Please connect the G-19B with main power source by wall or cigar chargers provided and then check out if G-19B works properly. If not, see the next FAQ.

Q:
G-19B is not working if the external power source is removed.
A:
Please switch the G-19B off and plug it with external power source. Let it charge for 2 hours and see if it is working after charging. If it is still not working after charging, you may change the battery.

Q:
The GSM indicator (Red LED) is still, but the GPS indicator (Blue LED) does not light on after a few minutes.
A:
Please make sure that your G-19B has a clear sky vision. Leave it there for 2 minutes. If you still have difficulties in getting the blue LED on, try other place. The unknown electrical interference may influence the signals.

Q:
Why the embedded battery cannot last for 24 hours as the specification says?

A:

24 hours will be reached if the G-19B is in standby mode. In another word, it's GPS status has to be in continuous tracking and always connected to the GSM network.

Q:

Why G-19B does not hang up my phone when I am dialing its number?

A:

The GSM network of where G-19B is in may not be good enough. The G-19B might not actually receive your call. You may have to wait for a while and dial again. Or you can send a SMS commands (page21) to request the response from G-19B.

Q: